

# **Strategic Implications of Global Health**

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*ICA 2008-10D*

# **Strategic Implications of Global Health**

*This Intelligence Community Assessment was prepared under the auspices of Karen Monaghan, National Intelligence Officer for Economic Issues, with the active collaboration of CIA, DIA/National Center for Medical Intelligence, and the National Counterproliferation Center. Inquiries may be directed to the NIO on 703-482-1232.*

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# Scope Note

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*Strategic Implications of Global Health* responds to a request from the Undersecretary of State for Democratization and Global Affairs for an intelligence assessment on the connections between health and US national interests. This study builds on a 2000 NIE, *The Global Infectious Disease Threat and its Implications for the United States*, a pioneering Intelligence Community effort to identify infectious disease as an intelligence issue.<sup>1</sup> This study diverges from that paper, however, in that it:

- Expands the field of inquiry to fully encompass all aspects of global health—including maternal mortality, malnutrition, chronic diseases and other relevant non-infectious health issues. While these may not represent *direct threats* to US interests in the way that acute infections do, these health determinants can also have wide-ranging—if more slow-moving and subtle—impacts on the global scene.
- Places a greater focus on the strategic impacts of global health, with minimal discussion of disease pathologies. This discussion is based in part on case studies of countries in the developing, communist, and post-communist worlds (see annex, p. 37) that illustrate the nexus between health and other strategic issues.

Many of the phenomena examined herein are occurring now, but are frequently unrecognized or unacknowledged outside the health community. Current WHO data indicate that three-quarters of all deaths by 2030 will be due to non-communicable factors (e.g., cancer, cardiovascular diseases, and traffic accidents), while deaths due to major infections such as HIV/AIDS, tuberculosis, and malaria will decline sharply even in the poorest countries (see graphic, p. 19). Although this is in a way a good news story—indicative of economic development worldwide—it also requires new ways of thinking about both global health and its strategic implications.

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*This paper is limited to examination of naturally occurring health phenomena, leaving the issues of bioterrorism and biowarfare for separate study.*

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<sup>1</sup> Other relevant NIC studies include: *The Next Wave of HIV/AIDS: Nigeria, Ethiopia, Russia, India, and China* (July 2002) and *SARS: Down But Still a Threat* (August 2003). Both papers can be accessed at [http://www.dni.gov/nic/NIC\\_specialproducts.html](http://www.dni.gov/nic/NIC_specialproducts.html).

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# Key Judgments

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Highly publicized virulent infectious diseases—including HIV/AIDS, a potential influenza pandemic, and “mystery” illnesses such as the 2003 outbreak of severe acute respiratory syndrome (SARS)—remain the most direct health-related threats to the United States, but are not the only health indicators with strategic significance. **Chronic, non-communicable diseases; neglected tropical diseases; maternal and child mortality; malnutrition; sanitation and access to clean water; and availability of basic health-care<sup>2</sup>** also affect the US national interest through their impacts on the economies, governments, and militaries of key countries and regions.

- Considerable empirical and theoretical studies have demonstrated the links between the health of a population and *economic* growth and development. An unhealthy labor force is logically less capable of engaging in physical labor, but the impact of poor health on cognitive ability is becoming particularly important as countries develop services and other sectors dependent upon intellectual capital to generate productivity and growth. Moreover, the issue of women’s health is especially urgent given the growing body of evidence that female participation in education and paid labor is integral to economic development.
- The ability to provide health-care and other basic services is viewed as a measure of a *government’s* legitimacy. Former South African president Thabo Mbeki was censured at home and abroad for failing to provide adequate health-care for persons with HIV/AIDS; health-care issues featured prominently in several recent elections in the Americas; and nonstate actors such as terrorists and warlords have gained local and international stature and even power by providing health services that governments could not.
- Widespread ill health in the youth cohort may reduce a country’s pool of healthy and capable *military* recruits, a phenomenon that is currently playing out in Russia and North Korea. Deployed military forces will continue to be vulnerable to the ravages of infectious diseases, and the capability of a government to provide adequate health protection for its troops will significantly impact its ability to project force abroad.

## Health-Related Challenges in Countries of Strategic Significance<sup>3</sup>

Health factors appear to be impacting countries of strategic importance to the United States in a number of different ways:

### *Reconstruction and Stabilization:*

- Inability of the central government of *Afghanistan* to provide health-care and other services has helped to undermine its credibility while boosting support for a resurgent and increasingly sophisticated *Taliban*. Moreover, wide incidence of traumatic births, malnutrition, and disease puts children there at high risk of impaired physical and cognitive

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<sup>2</sup> All health phenomena described in this paper are in fact inextricably connected and cannot be examined in isolation from each other. A chart showing these linkages can be found on pp. 51-52.

<sup>3</sup> More detailed country case studies can be found on pp. 37-49.

development, undermining their prospects of attending school, engaging in manual labor (including agricultural production), or participating in other forms of economic activity.

- A degraded health sector, shortages of medical personnel, and infections stemming from deficient sanitary conditions and lack of clean drinking water in *Iraq* have undermined the credibility of the central government. Widespread poor health also could complicate efforts to diversify the Iraqi economy beyond the oil sector into more labor- and skill-intensive areas.
- In both countries poor reproductive health among girls and women is a major impediment to advancing female education and workforce participation, both of which are important to enhancing prospects for economic growth.

#### *Rising Powers:*

- *Russia* has the overall worst health indicators of any industrialized country, and poor health undercuts efforts to diversify economic activity away from oil into more skill-intensive and value-added sectors. Poor health of Russian children and young people combined with falling birthrates also threatens Russian military readiness.
- *China's* high incidence of chronic disease—stemming in great part from heavy tobacco use—threatens to slow Chinese economic growth by incapacitating workers and incurring heavy health-care costs. The health effects of industrial pollution are an increasing source of discontent in China, while the recent outcry over contaminated baby formula seemed to weaken government credibility regarding the ability of the government to ensure public health and safety.
- *India* suffers from rampant malnutrition and anemia that cross all socio-economic classes, putting the majority of Indian children at high risk for impaired physical and cognitive disabilities.

#### *Adversarial States and Nonstate Actors:*

- Malnutrition-related cognitive disabilities among *North Korean* children and young people likely will impact future economic growth in that country regardless of when Pyongyang opens to the outside world or reunifies with the South. Nationwide malnutrition has compelled Pyongyang to lower minimum height and weight requirements for military service, and an estimated 17 to 29 percent of potential North Korean military conscripts between 2009 and 2013 will have cognitive deficiencies disqualifying them for service. .
- *Venezuela* and *Cuba* have been particularly adept at parlaying provision of charitable medical services to nationals of other countries into support in international forums such as the United Nations.
- *Hezbollah's* provision of health and social services in Lebanon over the past 20 years has helped to legitimize the organization as a political force in that country, while *HAMAS's*

delivery of similar services was a factor in its winning of legislative elections in the Palestinian territories.

### **Opportunities**

Health aid by the developed world is frequently targeted at infectious diseases seen as posing the greatest humanitarian or security threats, rather than to diseases and other health problems in developing countries that are persistent and overwhelming. HIV/AIDS, for example, garners about 25 percent of global health aid while constituting 5 percent of the disease burden in low- and middle-income countries.

Developed world efforts similar to the US fight against HIV/AIDS—but focused on broader global health objectives—could simultaneously help advance economic development, foster diplomacy, and improve overall health worldwide:

- **Medical Diplomacy.** States such as Cuba and Venezuela garner a disproportionate amount of international influence thanks to their provision of health services worldwide. More and better-publicized developed world medical diplomacy efforts—for example, the US Naval Ship Comfort’s humanitarian tour of 12 *Latin American* countries in 2007—could mitigate such influence while improving the health of citizens of poor countries.
- **Reconstruction and Stabilization.** In *Afghanistan*, amelioration of such major health challenges as hepatitis B, drug addiction, high maternal and child mortality, and access to basic health-care could bolster support for the Karzai administration and the allied reconstruction effort, a greater degree of gender equality, and economic development. Visible Coalition fostering of better health-care in *Iraq* could have a similar impact, as well as enabling the Iraqis to develop the human capital needed to grow and diversify their economy. Additionally, marked health improvements in these two Muslim countries could play a role in easing frictions between the West and the Islamic world.
- **Smoothing Relations with Adversaries.** Cooperation on health issues has historically kept international lines of communication open even at times of increased tensions among countries. Western health cooperation with *Iran* and *North Korea*—for example, assisting Pyongyang with the country’s heavy health burden, or encouraging Tehran to consolidate its recent improvements in health-care—could serve as a means of “diplomacy through the back door.”
- **Fruitful Engagement with Rising Powers.** International assistance with the significant health burdens stemming from environmental degradation could provide potential opportunities for cooperation with *China*, *India*, and *Russia*. In the case of China, shared interests by it and the developed world in strengthening African capacities to fight infectious diseases could be an additional means of cooperation.
- **Easing North-South Tensions.** Joint developed-developing world efforts to tackle inadequate health-care services in *poor countries*—frequently the result of South-to-North migration of health professionals in search of better pay, emphasis in some low- and middle-income countries on health tourism over provision of basic health-care, lack of affordable

drugs, and the resultant proliferation of harmful counterfeit medications—could be a means of trust-building between North and South.

- ***Advancing Economic Development.*** Increased developed world attention to the top three killers in the developing world—maternal and newborn mortality, infections of the lower respiratory tract, and diarrheal diseases, with their disproportionate impacts on young children—as well as highly debilitating neglected tropical diseases could simultaneously mitigate a tremendous portion of the health burden in low-income countries and help them out of poverty.

*Significant improvements to global health are increasingly beyond the capacities of any single actor. Multilateral organizations can be effective force-multipliers, reducing financial and other costs to any one country. The global health infrastructure is under strain, however, and successful execution of programs may require a fresh look at mechanisms for delivering health aid:*

- The World Health Organization is currently constrained by the fact that the bulk of monies provided by member countries are tied to the battling of single diseases. Freeing up funding for more comprehensive programs could render the WHO a more effective partner in fostering better global health.
- The Global Fund for HIV/AIDS, TB, and Malaria, an independent public-private partnership, has thus far been primarily focused on tackling of specific diseases, but its operating procedures offer ideas for multilateral cooperation on other health needs. These include fostering of multi-sector coalitions—governments, multilateral organizations, nongovernmental organizations, and private enterprise—to implement projects; heavy dependence upon local expertise for the running of programs; and placing a premium on results.
- A recent Center for Global Development study indicates that the effectiveness of initiatives is enhanced when affected governments and populations are not merely recipients of health aid but have a sense of ownership in the program.

## Terminology Used in This Paper

**Chronic Disease:** A disease that persists for three months or more and cannot be prevented by vaccines or cured by medication. Examples include cardiovascular disease (heart attacks, strokes, high blood pressure), diabetes, cancer, and obesity, which tend to become more common with age.

- **Drug Resistance:** The capacity of a disease-causing pathogen to resist at least one antimicrobial agent used in the standard treatment of the disease.
- **Multi-Drug Resistant (MDR):** A pathogen strain with resistance to at least two broadly different antimicrobial agents. In the case of tuberculosis MDR refers to resistance to at least two of the four “first-line” antibacterial treatment options.
- **Extensively Drug Resistant (XDR):** Refers to TB strains that are both MDR and resistant to at least one “second-line” treatment.

**Infectious Disease:** An illness caused by a specific infectious agent that is spread from an infected person, animal, or inanimate reservoir to a susceptible host, directly or indirectly through an intermediate plant or animal host, vector, or the inanimate environment.

**Endemic:** The constant presence of a disease or infectious agent within a given geographic area.

**Epidemic:** The occurrence in an area of a disease or illness in excess of what may be expected on the basis of past experience for a given population. In the case of a “new” disease, any occurrence may be considered “epidemic.”

**Health:** As used in this paper, health refers to absence of disease or infirmity. This is less comprehensive than the World Health Organization definition of health as “a state of complete physical, mental, and social well-being.”

**Health Statistics:** Health data used in this paper are frequently the result of extrapolations by the WHO or other international bodies to compensate for misreported, underreported, or missing numbers. The facts and figures cited in this paper should be read with that caveat in mind.

**Incidence:** The number of new cases of a disease that arise in a population in a given period of time.

**Maternal Mortality:** Deaths of women as the direct result of complications from pregnancy or childbirth.

**Morbidity:** Illness.

**Neglected Tropical Diseases:** Infectious diseases, most dating back to ancient times (e.g. leprosy), that thrive in impoverished settings. NTDs can be spread by insects, contaminated water, or soil infested with the eggs of worms, and transmission is exacerbated by poor hygiene.

***Newborn Mortality:*** Deaths of babies within their first month of life.

***Pandemic:*** A worldwide epidemic affecting an exceptionally high proportion of the global population.

***Pharmaceuticals:*** Branded prescription drugs, generic prescription drugs, and over-the-counter medications.

***Prevalence:*** The number of existing cases of a disease among a total or specified population at a given time, usually expressed as a percent or as the number of cases per thousand, 10,000, and so forth.

***Public Health:*** The collective actions taken by societies to protect the health of entire populations.

***World Health Organization (WHO):*** The directing and coordinating authority for health within the United Nations system.

# Discussion

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## The Continued Threat of Acute Infectious Diseases

Since the NIC's 1999 publication of *The Infectious Disease Threat and Implications for the United States*, health threats and issues have continued to have significant impacts on the world stage.

*The greatest infectious disease challenge for the US since the beginning of the decade has been the potential emergence of a severe influenza pandemic.* Although the H5N1 avian influenza virus remains primarily a threat to poultry, it and other such viruses continue to evolve and expand their geographic range.

- The timing and magnitude of the next influenza pandemic is difficult to predict. Given the increase in worldwide travel and commerce over the last several decades, however, one similar in magnitude to that of 1918 would disrupt the global economy, impair military readiness, and undermine global security and diplomacy.
- Instability in other parts of the world could ultimately be a drain on US medical, military, and financial resources.
- Worldwide preparedness for avian influenza and a human pandemic is improving, but from a very low base. Many countries lack the surveillance and response capabilities needed to cope with a true pandemic.

Aside from influenza, a number of other enduring, *high-profile infectious diseases*

continue to demonstrate the profound relationship between health and economics, governance, and security:

- The “Deadly Seven” (see box on page 13) that were the focus of *The Infectious Disease Threat* continue to retard stability and dampen development in poor countries, as well as encroaching upon the developed world.
- The rapid spread of severe acute respiratory syndrome (SARS) from China to several other countries in 2003 showed that even infectious diseases with very low incidence but high mortality—approximately 815 deaths worldwide—can generate significant economic, political, and diplomatic fallout.

A global campaign<sup>4</sup> to eradicate *polio* since the late 1980s has been enormously successful, with cases worldwide dropping from 350,000 in 1988 to less than 2,000 today, and with the number of countries where polio is endemic dwindling from 125 to four (Nigeria, Afghanistan, India, and Pakistan) during the same period according to the WHO. Polio's renewed spread over the past five years, however, has demonstrated that promising attempts to eradicate diseases can be set back by political, cultural, and religious factors.

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<sup>4</sup> Key players are the WHO, UNICEF, and Rotary International.

## Infectious Disease and US National Security

As indicated throughout this paper, a number of infectious *and* non-infectious health conditions shape the world we live in—and by extension can impact US interests. Infectious diseases for the foreseeable future, however, will remain the top health-related threat to US national security:

- Americans at home will continue to be vulnerable to emerging and re-emerging infectious diseases—many of which will originate overseas (e.g. HIV/AIDS, West Nile, and dengue fever)—including a potential influenza pandemic or an outbreak of a “mystery” disease (e.g., SARS).
- Infectious diseases are likely to continue to significantly impact military operations. Particularly with deployments of US military personnel to developing countries on the rise, US forces could be increasingly vulnerable to mission-compromising outbreaks of diseases borne by insects or local food and water.
- In the case of multinational missions, health of US forces—not to mention mission readiness—could be compromised by failure of coalition partners to provide adequate health protection measures to their troops.
- Infectious diseases *in concert with non-infectious conditions* are likely to slow socioeconomic development in developing and formerly communist countries of interest to the US—with possible impacts on democratization and regime stability.
- Infectious disease-related embargoes and restrictions on travel and immigration—especially in the wake of an influenza pandemic—could cause diplomatic frictions between the US and other countries.
- Although beyond the scope of this paper, the possibility of a bioterrorist attack against US civilian and military personnel overseas or in the US could grow as more states and groups develop a biological warfare capability.

- Religious leaders in Kano State, Nigeria, halted polio vaccinations in 2003 owing to rumors that the vaccines were a Western plot against Muslim populations. This led not only to a resurgence of cases of the disease in northern Nigeria, but also its spread to previously polio-free African countries in western and central Africa

and in the Horn.<sup>5</sup> It also caused outbreaks as far away as Yemen and Indonesia.

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<sup>5</sup> Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo-Brazzaville, Cote d’Ivoire, Ghana, Guinea, Mali, Togo, and Sudan.



## The “Deadly Seven:” Where Are They Now?

At the time of publication of *The Global Infectious Disease Threat and Its Implications for the United States* in 2000, the below-listed diseases were the most deadly infections in the world. Although global health activism over the past decade (see box, p. 16) has helped to make some inroads into the fighting of these diseases, progress on controlling or eradicating the “Deadly Seven” is decidedly mixed.

*Measles* provides the most cause for optimism, with incidence dropping sharply under the Measles Initiative, a US-UN partnership launched at the beginning of the decade.<sup>6</sup> Stepped-up immunization efforts combined with distribution of vitamin A supplements within the developing world has cut the number of deaths by 68 percent globally (91 percent in Africa). At the same time, however, measles has resurged in the US and Europe partly as the result of parents refusing to vaccinate their children for religious and safety concerns.

*HIV/AIDS*, on the other hand, has been a one-step-forward-one-step-back scenario. On the positive side, improved data led UNAIDS last year to downgrade its global estimates of sufferers from 39 to 33 million, including a halving of cases in India.

- More accurate numbers were not the whole story, however. Worldwide, HIV/AIDS prevalence reached a global peak of nearly six percent around 2000 but had fallen to about five percent in 2007. Even in the central and southern regions of sub-Saharan Africa which continue to bear the brunt of the disease, the rate of new infections peaked several years ago, in part attributable to changes in behaviors and growth in the number of Africans on antiretroviral drugs.
- In Asia, aggressive targeting of high risk groups (e.g., drug users and sex workers) has slowed the spread of HIV/AIDS. Thailand and Cambodia, for example, both reduced their HIV/AIDS prevalence through education and condom campaigns aimed at sex workers and their clients.

Failure of an HIV/AIDS vaccine trial this year, however, after 25 years of research and billions of dollars spent dashed hopes of an effective vaccine for the foreseeable future.

- Another minus on the HIV/AIDS balance sheet is growth of incidence in Latin America and the Caribbean. As of 2006, there were an estimated 2 million infected persons in those regions—more than in the US, Canada, Western Europe, Australia, and Japan combined.

(Continued on next page...)

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<sup>6</sup> Partners include the American Red Cross, the US Centers for Disease Control and Prevention, the UN Foundation, UNICEF, and the WHO.

(Continued...) **The “Deadly Seven:” Where Are They Now?**

Research linking widespread use of a new type of *malaria* net—that can repel and kill mosquitoes for a number of years—with sharp drops in incidence of that disease in some focused areas seems to promise a *potential* means to slow transmission and diminish its impact. This progress has led to a recent proliferation of efforts by national governments, international organizations, the Gates Foundation, the Global Fund, and grassroots campaigns to buy nets for children in the developing world.

- Malaria remains, however, the fourth biggest killer of children—young children in Africa comprise most of the 350-500 million cases and one million deaths annually—and 41 percent of the world’s population lives in areas where malaria is transmitted.
- Climate change could further complicate malaria control by expanding the geographic reach of the disease (see box, p. 15).
- *Other mosquito-borne tropical diseases* have recently increased in incidence and now pose significant global health risks. *Dengue fever*, in particular, is a massive urban threat in the developing world—endemic in more than 100 countries and endangering around 2.5 billion people according to the WHO.

Death rates for the remaining four “Deadly Seven” diseases have seen little change since publication of the 1999 NIE:

An estimated 1.7 million persons died of *tuberculosis* in 2006 (including 200,000 cases of HIV-associated TB), as programs such as the WHO’s “Stop TB” initiative (aiming to halve TB prevalence and death by 2015) have been slowed by the spread of HIV-associated and drug-resistant strains.

*Diarrheal diseases*—the direct result of consumption of waste-polluted water and lack of access by 40 percent of the world’s population to hygienic toilets—remain top killers of children in the developing world.

- *Poor sanitation* has to date received insufficient remediation, but the UN’s designation of 2008 as the “International Year of Sanitation” seeks to raise awareness that clean drinking water and sanitary facilities may be as important as vaccines or antibiotics in saving lives.

*Lower respiratory infections* also retain their place as major childhood killers and are directly related to *land and air pollution*—which also underlie chronic conditions such as asthma, cancer, and cardiovascular disease.

*Hepatitis B and C* remain endemic in the developing world, with chronic carriers numbering in the hundreds of millions. Both viruses can cause permanent liver damage leading to death from cirrhosis of the liver and liver cancer.

## Climate Change and Infectious Diseases

Alterations in temperature, humidity, and precipitation accruing to climate change may be factors in expansion of the geographic range of mosquito-borne infectious diseases such as malaria, yellow fever, dengue fever, and West Nile virus.

- Rising temperatures could also increase the risk of waterborne diseases such as cholera through increased pathogen survivability in the environment.

A related issue, *habitat destruction*, is newly exposing humans to pre-existing plant and animal disease agents, and causing new disease pathogens through mutations or adaptations enabling diseases to cross the species barrier (examples of diseases that have made such a jump include HIV/AIDS, SARS, and numerous influenza strains). A related issue, *biodiversity loss*, could also negatively impact creation of new medicines (see box on pharmaceuticals, p. 27).

- Human adaptations to climate change—migration, urbanization, and changing agricultural practices—could act as the means for further spread of existing diseases or emergence of new ones.
- A country's ability and willingness to identify and respond to changes in disease incidence through public health measures will be crucial. Countries most vulnerable to climate change-induced transmission of infectious diseases are those that combine extreme poverty, poor or non-existent health-care infrastructures, and an already high infectious disease burden.

- Northern Nigeria saw a new outbreak of polio in 2008—again with the potential to cause major international outbreaks—because at least 20 percent of children there remain unvaccinated.
- Heightened public and government concern about SARS and the prospect of an influenza pandemic—as well as the anthrax attack in the US in late 2001—has been driven by a media-generated “*fear factor*” that may simultaneously heighten awareness and hamper disease control:
  - An element of surprise is a chief underlying cause of the fear factor: new diseases have emerged at an unprecedented rate since the 1970s (approximately one per year, including HIV/AIDS and SARS) and old ones have attained greater geographic reach (e.g., arrival of West Nile virus in North America a decade ago) thanks to population growth, urbanization, travel, commerce, and climate change (see box, p. 17).
  - Global focus on the most frightening diseases may direct public health funding to those health risks that are the most publicized—rather than those with the highest impact on morbidity and mortality.
  - At the same time, however, media attention to health phenomena may have some positive outcomes such as increased attention to health research and more general disease detection and control measures.

## New Players on the Global Health Scene

Over the past decade a number of private actors with deep pockets have emerged on the global stage as key players in the fight against infectious diseases. Although private involvement in the fight against infectious diseases is longstanding,<sup>7</sup> these players are notable for their number and scope and their ability to generate public enthusiasm and an unprecedented outpouring of government and private funds for global health initiatives.

- Between 1995 and 2005 the Bill and Melinda Gates Foundation and predecessor organizations spent \$6 billion on HIV/AIDS-, malaria-, tuberculosis-, and other health-related initiatives, including grants to the public-private efforts of the Global Fund to Fight AIDS, TB, and Malaria (see p. 30), and the Global Alliance for Vaccines and Immunization.
- “Super-Empowered Individuals” such as former US presidents Jimmy Carter and Bill Clinton; former UK Prime Minister Tony Blair; former UN Secretary General Kofi Annan; entertainers Bono, Angelina Jolie, and Richard Gere; businessman Ted Turner; and economist Jeffrey Sachs have also been active in bringing the health problems of poor countries to global attention.

A key result of this health activism is proliferation of global health *public-private partnerships (PPPs)*, which have grown in number from a handful in the late 1990s to around 100 today. PPPs—partnerships among pharmaceutical or biotechnical companies, academia, nongovernmental organizations, UN agencies, and interested developed-world governments—have tackled the problem of drug companies’ reluctance to invest in research on diseases that primarily afflict poor countries.

- Research grants to pharmaceuticals companies make them more willing to lend their scientific expertise to otherwise unprofitable global health efforts. *A particular beneficiary of PPPs have been Neglected Tropical Diseases (NTDs)* (see p. 20), with PPPs since 2000 launching more than 60 NTD-related drug projects.

The new global health activism has not been an unalloyed success, however:

- Players have often set timetables that ignore on-the-ground realities, and the “vertical” (or targeted solutions to single health problems) approach is often impossible to implement in poor countries where general public health-care systems are substandard. Such efforts may actually undermine public health system delivery by overburdening local facilities or recruiting local medical personnel to work in foreign-funded and better-paying programs.
- There are no global mechanisms for ensuring the accountability of the multitude of health players or seeing that the efforts of UN bodies, national programs, traditional NGOs, private actors, or grassroots campaigns do not replicate each other.

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<sup>7</sup> The Rockefeller Foundation has engaged in global public health activities for almost a century, and Rotary International has been a major player in polio eradication efforts since the 1980s.

## Beyond The “Usual Suspects”

*The most publicized public health risks are not the only ones with strategic significance.* The health conditions listed below can be as instrumental as acute infectious diseases in helping to shape the economies, governance, and security of countries of strategic importance to the US. They are frequently overlooked, however, by governments, publics, and the media because they lack the immediacy and urgency of acute infections.

- The health phenomena in this section and in the preceding one on acute infectious diseases are inextricably linked (see chart on “Linkages Among Health Factors,” pp. 51-52), and impacts may vary greatly among countries or regions.<sup>8</sup>

### Chronic, Non-communicable Diseases

Obesity, high blood pressure, diabetes, cancer, and heart disease—take twice as many lives annually as infectious diseases. They are the leading cause of death and disability worldwide—with the current exception of Sub-Saharan Africa—and this trend is projected by WHO to continue until at least 2030 as the global population ages.

- In spite of popular perceptions of chronic diseases as a developed world problem, 80 percent of such illnesses occur in low- and middle-income countries. This high figure is in part a reflection of the fact that the bulk of the world’s population lives in such countries. It is also the result, however, of increased urbanization, resultant rising levels of obesity, and environmental degradation in the developing world.

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<sup>8</sup> Health factors in this section are not listed in priority order.

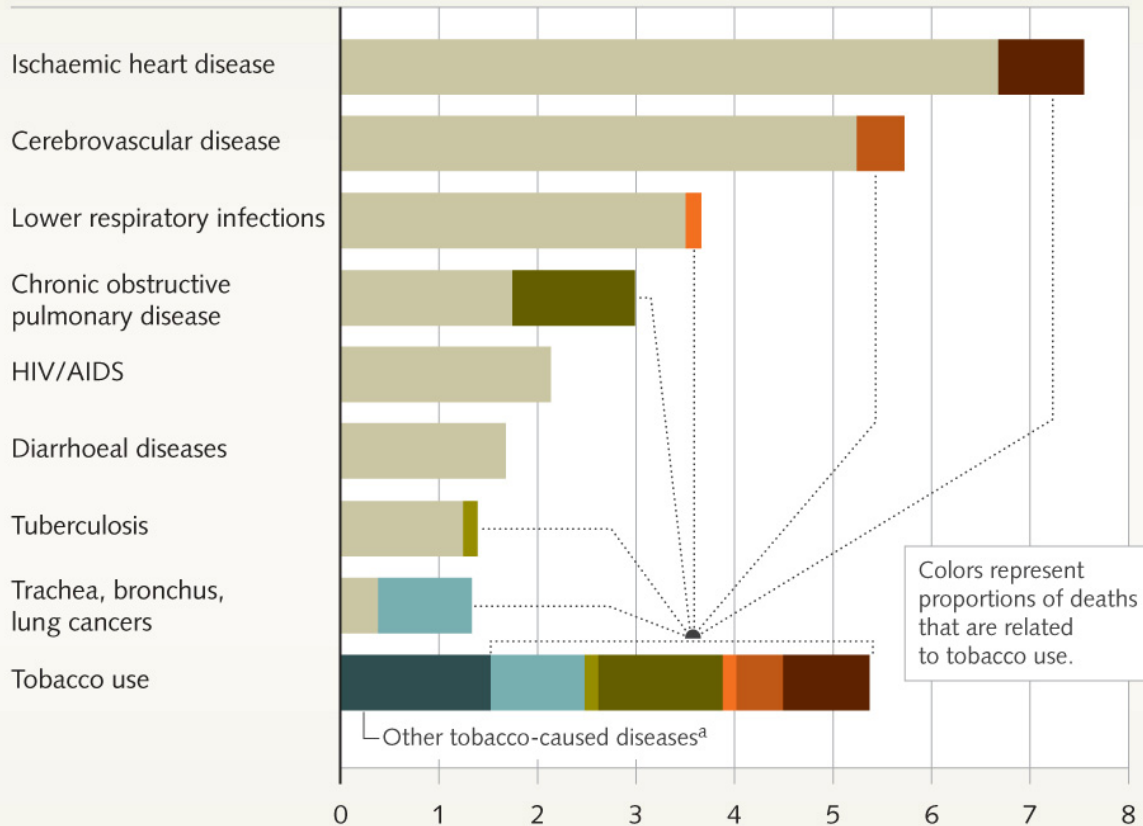
## Behavior and Health

*Risky behaviors and lifestyle factors* such as poor diet, lack of exercise, smoking, alcoholism, reckless driving, and drug abuse underlie many chronic and infectious conditions and heighten susceptibility to early death.

- Tobacco is the single leading cause of preventable death in the world today, according to the WHO. It contributes to the mortality of a third to a half of all those who use it (22 percent of adults worldwide), and is a risk factor for six of the eight leading causes of death (see graph on page 18).
- A major but still underappreciated cause of mortality, deaths due to road traffic accidents, will go from ninth leading cause of death worldwide in 2004 to fifth leading cause of death in 2030, primarily owing to increased motor vehicle ownership, poor road conditions, and lack of public safety programs in low- and middle-income countries.
- Pregnant women who consume poor diets, engage in drug or alcohol abuse, or smoke also increase the risk of poor health in their children.
- Risky behaviors spread infections as well, however, with unsafe sex and intravenous drug use directly culpable in transmission of HIV/AIDS and Hepatitis B.

## The Eight Leading Causes of Death Worldwide and Deaths Attributable to Tobacco Use, 2005

Millions of deaths



<sup>a</sup>Includes mouth and oropharyngeal cancers, esophageal cancer, stomach cancer, liver cancer, other cancers, cardiovascular diseases other than ischaemic heart disease and cerebrovascular disease, diabetes mellitus, as well as digestive diseases.

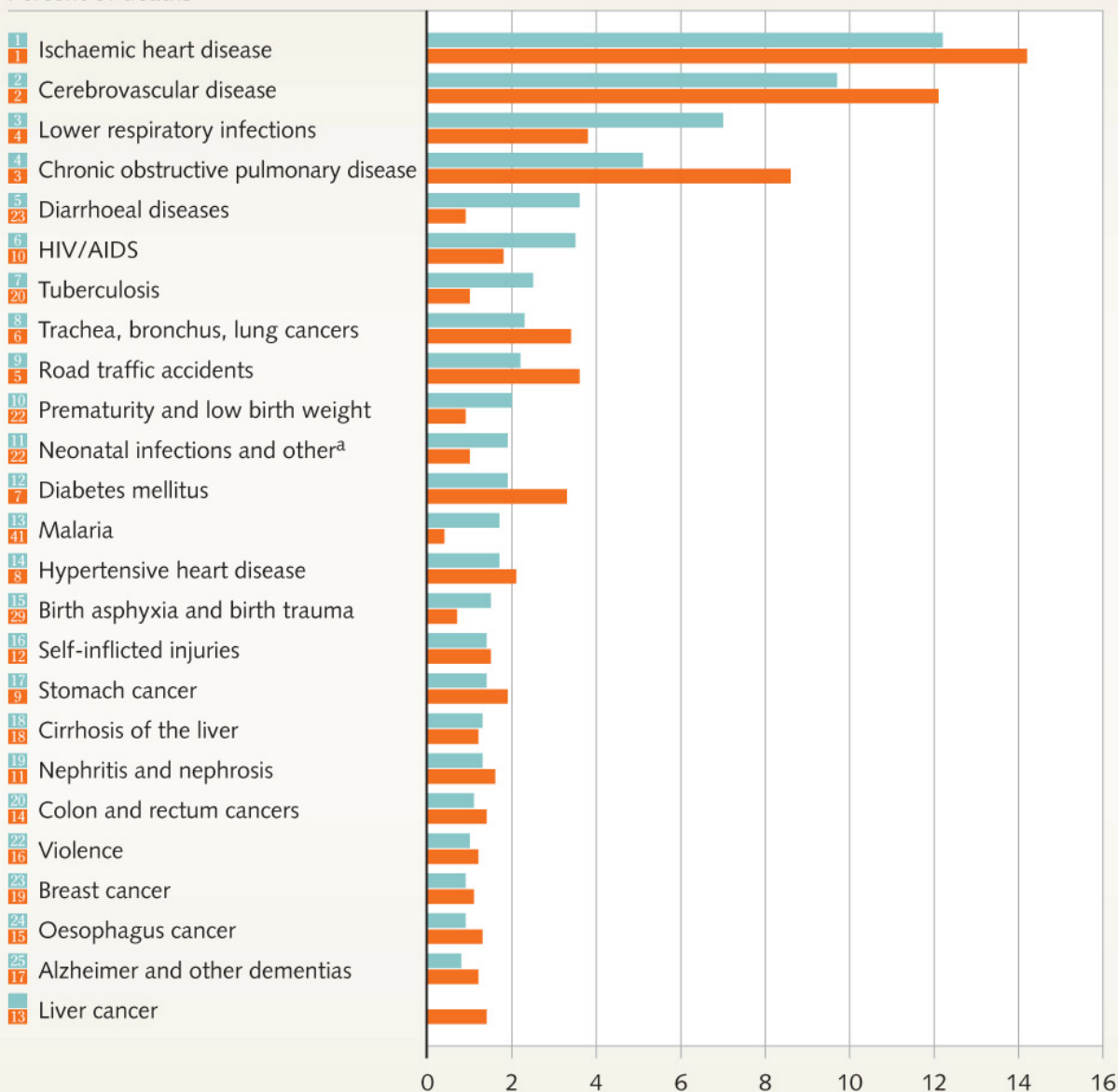
Source: World Health Organization.

- Additionally, lack of treatment options means that chronic illnesses are often more deadly in developing countries than in developed ones.
- Many low- and middle-income countries undergoing economic transition may in fact suffer a double disease burden, with rising incidence of chronic illnesses *and* abiding prevalence of infectious diseases.



## Leading Causes of Death, 2004 and 2030 Compared

Percent of deaths

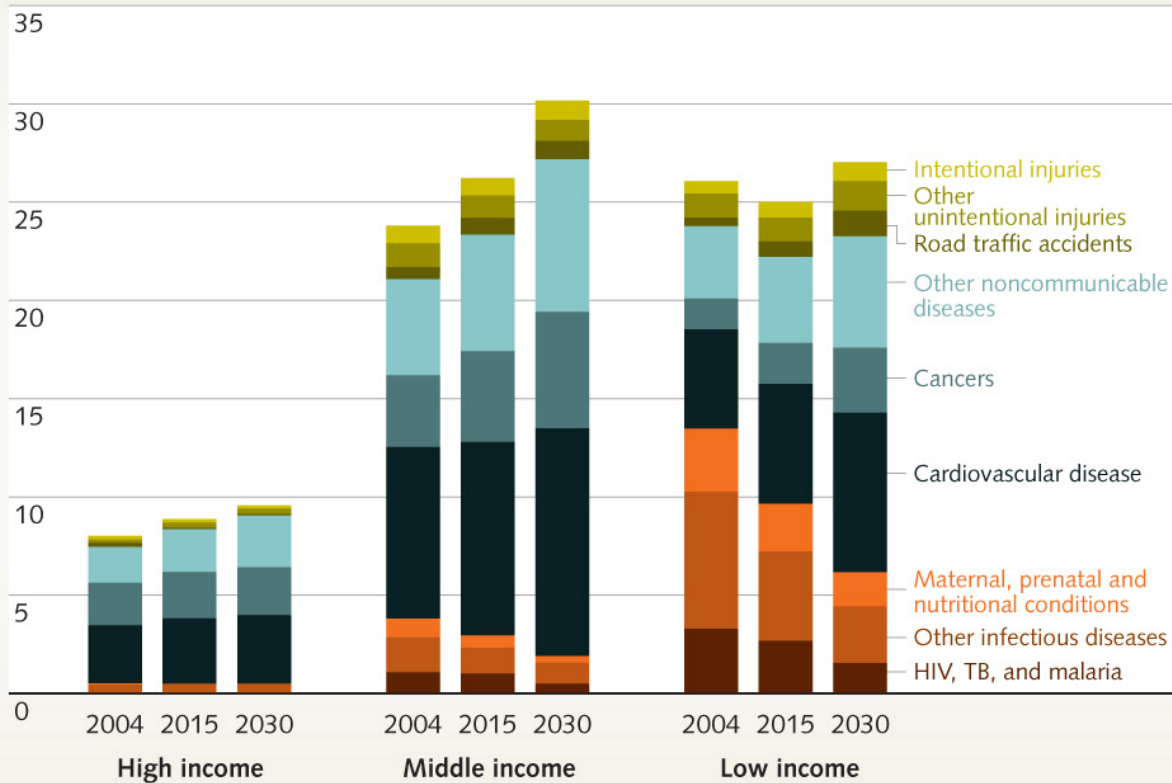


<sup>a</sup>Comprises severe neonatal infections and other, noninfectious causes arising in the perinatal period.

Source: World Health Organization.

## Projected Deaths by Cause for High-, Middle-, and Low-Income Countries

Millions of deaths



Source: World Health Organization.

### Neglected Tropical Diseases (NTDs) (U)

**NTDs** are chronic infectious illnesses that can be severely disabling or deforming. They are caused primarily by bacterial, protozoan (one-celled organism), and helminth (worm) infections, and afflict around one billion of the poorest people—predominately in remote rural areas in Sub-Saharan Africa.<sup>9</sup>

- NTDs can cause long-lasting anemia; increased maternal and infant morbidity and mortality; impaired vision and blindness; heart conditions; and profound disfigurement. A rapid-impact package of drugs has been developed for treatment of the most common NTDs, but potential adverse reactions, drug resistance, or re-infection after treatment remain threats.

<sup>9</sup> The 13 major NTDs in order of prevalence are Ascariasis (roundworm), Trichuriasis (whipworm), Hookworm, Schistosomiasis (snail fever), Lymphatic Filariasis (elephantiasis), Trachoma, Onchocerciasis (river blindness), Leishmaniasis, Chagas' Disease, Leprosy, Human African trypanosomiasis (sleeping sickness), Buruli ulcer, and Dracunculiasis (Guinea worm).



- Incidence of some NTDs is decreasing, however, thanks in part to public-private partnerships (see box on “New Players,” p. 16). Trachoma cases have fallen from an estimated 360 million persons in 1985 to approximately 80 million today; leprosy cases have been cut from 5.2 million to less than 220,000 over the same period; river blindness has been eradicated from large swathes of West Africa (previously the most severely affected area); Guinea worm is slated for total eradication by next year; and elephantiasis treatment expanded from 25 million persons in 2000 to 321 million in 2005, according to the WHO.
- Lack of access to basic health services before, during, and after delivery is a key contributor to high maternal and infant mortality, and proximity to armed conflict, poverty, and locations in rural areas exacerbate high maternal and newborn mortality rates.

### **Malnutrition**

Chronic *malnutrition* among children—either before or for extended periods after birth—frequently results in stunted growth, and may cause chronic physical and cognitive problems and premature death. Malnutrition also lowers immunity to infection and can inhibit the body’s ability to react to treatment among persons of all ages.

### **Maternal and Child Health and Mortality**

“Improve *maternal health*” and “reduce *child mortality*” are two of the UN Millennium Development Goals (see box, page 22). *Deaths in childbirth, however, remain one of the top killers in the developing world. Moreover, mortality rates for newborns (babies in their first month of life) have barely budged over the past decade.*

- Poor maternal health and high maternal mortality impact millions of women annually, with 529,000 deaths in childbirth—98 percent in the developing world, mostly Sub-Saharan Africa and southern Asia—and 10 to 20 million women suffering injury or infection.
- While death rates for children up to age five have been reduced by 14 percent since the 1990s, deaths of newborns remain stalled at 30 per thousand births or 4 million per year globally. Seventy-five percent of these deaths occur within the first week after birth.
- Malnutrition can be caused by lack of food as well as insufficient or nutrients for proper health.
- The most common form of malnutrition is iron deficiency, which affects up to 80 percent of the world’s population. A related problem, *anemia*, is frequently suffered by pregnant women and persons with cancer, liver failure, or diabetic complications, and iron deficiency anemia can cause impaired cognitive and neurological development in children.

## **The UN Millennium Development Goals (MDGs): A Scorecard**

The UN's MDG program, launched in 2000, ostensibly provides a blueprint for meeting the needs of the world's poorest people by 2015. *Goals 1, 4, 5, and 6 (out of eight total) pertain directly to the health issues addressed in this paper but are unlikely to be achieved on time by a majority of countries.* Successes have generally been achieved because of economic growth in China, India, and other populous emerging economies.

**Goal 1:** *Eradicate extreme hunger and poverty.*

**Target:** Halve, between 1990 and 2015, the proportion of people who suffer from hunger.

**Status:** Progress in reducing the prevalence of hunger masks lack of progress in reducing malnutrition—a situation unlikely to be ameliorated in the face of rising food and energy prices. (U)

**Goal 4:** *Reduce child mortality.*

**Target:** Reduce the under-five mortality rate by two-thirds between 1990 and 2015.

**Status:** The probability of a child dying before age five fell from 10.1 percent in 1990 to 7.9 percent in 2006, but this is insufficient to meet the target by 2015. Newborn mortality also remains problematic (see previous page).

**Goal 5:** *Improve maternal health.*

**Target:** Reduce the maternal mortality rate by three-quarters between 1990 and 2015.

**Status:** This is the worst-performing MDG. From 1990 to 2005 the number of maternal deaths per births only fell from 430 to 400 per 100,000—less than 10 percent of the reduction needed to meet the MDG goal by 2015.

**Goal 6:** *Combat HIV/AIDS, malaria, and other diseases.*

**Target:** Halt and begin to reverse the spread of HIV/AIDS, malaria, and other diseases by 2015.

**Status:** Some progress on the first two (see box on “The Deadly Seven,” p. 13) but progress on many other infectious diseases (with the exception of polio, measles, and some NTDs) has been less sustained.

## Adding It Up: Strategic Impacts of Global Health

A number of infectious and non-infectious health issues appear to have linkages with broader economic, political, and military issues. Considerable empirical and theoretical studies have been done on the relationship between health and *economic* growth and development. The clearest evidence of a causal link has been the economic impact of high-profile infectious diseases, impacts previously examined by the NIC.<sup>10</sup>

- Through hits to air travel, tourism, retail, and manufacturing, SARS caused a significant, if temporary, slowing of economic growth in East Asia and Canada—particularly in the cities of Hong Kong, Beijing, and Toronto—in the first part of 2003, according to *SARS: Down But Still a Threat*.
- High HIV/AIDS and malaria burdens in Sub-Saharan Africa have dampened GDP growth in the most heavily impacted countries, according to numerous WHO and World Bank estimates.

### Economics

Non-infectious conditions, however, also exact economic costs that are often underreported or underappreciated:

- Chronic diseases, because of their lingering nature, impose a particularly heavy burden in the developing world. Families in poor countries are much more likely than in the West to deplete their savings or to pull children out of school to

nurse sick relatives, according to *The Economist*.

*Historically, progress on health issues has correlated in a number of countries with improved economic development and growth by expanding the pool of healthy and productive workers. Today, when global productivity is driven as much by development of intellectual capital as by possession of natural resources or advances in technology, attention to health issues is a key determinant as to whether countries can escape poverty.*

- The importance of good health is illustrated by Nobel-prize winning economic research that attributed 50 percent of *British* economic growth from 1790 to the present day to greatly improved nutrition and health during the course of the 19<sup>th</sup> century.
- In the present day, improvements to *Mexico's* health-care infrastructure correlate with unprecedented growth of the Mexican economy since the 1970s, according to the *Journal of International Development*.
- In *Singapore*, drastically improved health indicators since the 1960s—particularly provision of modern sanitation and health-care, efforts to control malaria, and stringent monitoring of other infectious diseases such as dengue fever—correlate with a leap in GDP from \$512 in 1965 to \$26,836 in 2005, according to Reuters.

*Conversely, poor health reduces the availability of healthy and productive workers that can have life-long impacts and precludes large segments of the population from economic participation.*

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<sup>10</sup> For example, *The Next Wave of HIV/AIDS: Nigeria, Ethiopia, Russia, India, and China* (July 2002) and *SARS: Down But Still a Threat* (August 2003). Both papers can be accessed at [http://www.dni.gov/nic/NIC\\_specialproducts.html](http://www.dni.gov/nic/NIC_specialproducts.html).

- Stunting (low height-for-age) as a result of malnutrition has been associated with lower educational achievement and cognitive ability (see box this page), and by extension lower economic status in adulthood, according to the UN Standing Committee on Nutrition. Women who are stunted or who otherwise suffer poor health tend to have babies with lower birth-weights, contributing to intergenerational poverty.
- Along these lines, it is likely that malnutrition-related cognitive disabilities among North Korean children and young people—resulting from the 1990s famine, as well as the widespread hunger that persists to this day—will inhibit future DPRK economic growth, with or without opening to the outside world or reunification with the South.
- In the most remote parts of the world *NTDs* contribute to the perpetuation of extreme poverty: hookworm-related cognitive disorders severely undermine the ability of children to attend school, while such illnesses as river blindness and elephantiasis make manual labor—including agricultural production—impossible.

*If enhancing female participation in education and the paid workforce is key to both economic development and societal stability, as many academic studies suggest, the issue of women and health takes on particular economic significance.*

- There is a significant correlation between rising female literacy and more robust GDP growth within a region, and women are more likely than men to use earnings to nourish and educate children.

### Effects of Malnutrition on Intelligence

The most critical period for brain development is thought to be within the first two to three years of life. The nutritional status of pregnant women also significantly affects fetal development. Higher intelligence test scores have been correlated with increased school and work performance, less socially delinquent behavior, quicker reaction times, and increased longevity.

Studies in young children and adolescents suggest that chronic malnutrition occurring before age two can lower IQ by approximately 5 to 15 points, depending on the type and extent of nutrient deprivation. Deficiencies in iron, iodine, and various vitamins have been most frequently implicated. Remedial supplementation in older children and adults may only partially reverse cognitive deficits. (Source: The National Center for Medical Intelligence)

Poor reproductive health, on the other hand, limits the ability of girls and women to get an education or participate in paid labor, and maternal illness and death can undermine families due to loss of women's important non-paid contributions, particularly in the developing world: food production, water collection, caring for children, the ill, and the elderly.

Newly emerging economies are also affected by poor health. *Deficient health-care systems and heavy health burdens in China, India, and Russia<sup>11</sup> could in the long run slow those countries' economic growth trajectory*—especially by derailing their ability to diversify their human capital into more skill-intensive and value-added economic sectors.

<sup>11</sup> These countries along with Brazil were recognized by Goldman Sachs in 2005 as the largest and most important emerging economies (the “BRICs”).

- All three countries have poorer-than-average health-care systems. In a WHO ranking of 190 of the world's health systems, India was 112, Russia was 130, and China was 144.

Even if growth of those economies in the aggregate is not severely impacted, health factors such as disease, malnutrition, and risky behaviors could erode potential for gains in *personal wealth*.

In *China*, widespread poor health threatens to slow economic growth by incapacitating workers and incurring heavy health-care costs. Negative health indicators in China include the difficulty many have in affording health-care; a heavy burden of chronic disease, some of which stems from heavy tobacco use; and multiple health problems (infectious and chronic diseases, birth defects) resulting from severe environmental degradation.

In spite of *India's* elimination of famine since independence, severe and endemic hunger persists across the country, while malnutrition is a problem even in the wealthiest segment of Indian society. Anemia—with its ability to inflict permanent cognitive damage—affects more than two-thirds of Indian children, crossing all economic and societal lines, and as in the case of North Korea could inhibit future economic growth (see box on “The Effects of Malnutrition on Intelligence,” page 24).

*Russia* has the worst health indicators of any industrialized country: one of the highest HIV infection rates in the developed world; a first place ranking globally for multi-drug resistant TB strains; a cardiovascular disease rate that is higher than most other developed countries; a high rate of alcohol consumption—which has also made Russia a world leader in violent deaths and accidental poisonings—and considerable challenges for

long-term health associated with chronic exposures to lead, mercury, and other chemicals due to environmental contamination.

- The WHO projects Russia's annual income loss from deaths due to chronic diseases alone could increase from 1 percent of GDP in 2005 to over 5 percent by 2015.

Countries with generous endowments of high demand natural resources such as major energy producers Russia and *Nigeria* have not so far seen high health burdens cut into their GDP growth. Similarly, major diamond producer *Botswana* is enjoying robust economic growth in spite of having one of the highest HIV/AIDS prevalence in the world. These countries may face major challenges, however, in diversifying their economies away from extractive industries towards more highly-skilled and labor-intensive work due in part to health burdens.

- This problem in Russia and Nigeria could be perpetuated by those governments' disinclination thus far to use natural resources windfalls to fund improved health-care.

Access or lack of access to health-care, as well as quality of care provided, magnify social divides between rich and poor, urban and rural areas, and indigenous and non-indigenous peoples and by extension ensure the continued impoverishment of those who are denied health services:

- In spite of efforts to broaden the accessibility of the *South African* health system in the post-Apartheid era, whites—who are more likely to have private health insurance—still have significantly greater recourse to medical services than blacks with their reliance

## The Globalization of Health

Health-care is one of the fastest-growing sectors in the world, and international trade in health services has created economic and diplomatic opportunities for both medical personnel and countries—especially those that are low- or middle-income.

*Following the money.* Migration of health care professionals in search of higher incomes or more amenable working conditions is long-standing and not strictly a North-South phenomenon—e.g., German doctors have moved en masse to Switzerland since the 1990s to escape the dislocations of reunification and high unemployment at home. The bulk of this migration is from the developing to developed worlds, however—often as the result of aggressive recruiting by developed world facilities.

*Deliberate export of medical professionals.* The Philippines, for example, has for decades encouraged its nationals—including medical personnel—to work overseas in order to provide remittances to their home country.

- Since 2000 at least 11,000 Filipino doctors have retrained as nurses—who can be certified abroad more easily than doctors can—and their departure has fueled a precipitous decline in rural health services, according to press accounts.

*Health diplomacy.* In addition to being a source of income, however, deployment of health workers has also long served as a means for developing countries to project “soft power” worldwide.

- Since the 1960s, for example, China has deployed health workers to almost 50 African countries; Cuba, another long-standing practitioner of medical diplomacy, has medical personnel in around 70 countries worldwide, as well as providing medical training to developing country students; and Venezuela’s four-year-old “Mission Miracle” provides free eye surgery to Latin America’s poor.

*Medical or health tourism.* Citizens of developed-world countries increasingly travel to low- or middle-income countries to avoid high health-care costs, circumvent long waiting lists, or obtain treatments unavailable at home. Medical tourism has given rise to “health tourism providers” (intermediaries who match patients with medical facilities abroad), as well as insurance companies that offer global health care options.

- Such practices remain controversial, however. Although poor or middle-income countries may benefit financially or diplomatically from caring for developed world patients or deploying their medical personnel, such practices frequently have coincided with deterioration of health services for the average citizen in provider countries.

## Pharmaceuticals: The Best of Times, The Worst of Times

Growing health awareness among publics and governments, changing world demographics, and ease of purchasing medications over the internet are spurring record growth in the global pharmaceuticals markets—from an estimated \$737.6 billion in 2008 to over \$1.0 trillion by 2013, according to BCC Research. Robust sales figures, however, mask a number of problems worldwide with pharmaceuticals production and delivery:

- *Access to affordable drugs serves as a lightning rod in debates about economic justice and global inequality.* Differing views regarding patent protection for pharmaceuticals—developed world pharmaceuticals companies and their governments see the patent system as essential for the companies’ economic survival, while a number of developing countries consider low-cost or free access to pharmaceuticals (e.g., antiretroviral treatments for HIV/AIDS) as a fundamental right—has pitted North against South.
- *Inappropriate use of therapeutic drugs worldwide has contributed to the rise of multi-drug resistant and extensively-drug resistant strains of diseases such as malaria, TB, and hospital-acquired staph infections.* Such strains have outstripped the rate of discovery of new antibiotics—in part because of escalating costs of bringing new drugs to market—and thrown the future efficacy of antimicrobials into serious doubt.
- *A proliferation of counterfeit pharmaceuticals is burgeoning worldwide,* increasingly threatening public health and safety—particularly in the developing world and the former Soviet republics. At best, counterfeit medicines have unpredictable therapeutic benefit; at worst, they can cause severe illness or death due to chemical toxicity, or can cause drug resistance or prolonged illness due to suboptimal amounts of active ingredients. China, India, and Russia are thought by the WHO and major pharmaceuticals companies to be the leading global suppliers of counterfeit medicines.
- Counterfeit and substandard drugs contribute to approximately 500,000 deaths each year, exacerbating drug resistance and undermining international public health programs.

upon an under-funded public health system.

- Public health-care in *India* is overburdened in cities and virtually non-existent in villages. A thriving private system fills some gaps but is unregulated and ruinously expensive for most Indians.
- In *Nigeria* health-care shortfalls are most pronounced in the North, adding to the

already tense relationship between northern Muslims and southern Christians.

- Out-of-pocket payments for health-care in cases of severe illness or major injury are a leading cause of financial catastrophe and impoverishment in countries at all levels of development, but especially in low-income countries.

## Governance

In the area of *governance*, impacts of health will likely be less pervasive.<sup>12</sup> Health can, however, visibly undermine the credibility of governments, contribute to long-term governance challenges, and help determine the winners and losers of national elections:

- Governments perceived as unable or unwilling to protect their populations from disease, malnutrition, and other health risks have been subject to international and domestic censure. South Africa's denial of its HIV/AIDS crisis over the past several years, for example, appears to have had a role in discrediting the Mbeki administration.
- China's delayed response during the SARS crisis of 2002-2003 earned it international censure, the health effects of industrial pollution are an increasing source of discontent among the Chinese populace, and the recent outcry over contaminated baby formula seemed to weaken government credibility regarding its ability to ensure public health and safety.
- Incumbent leaders' failure to meet public expectations on a broad range of social services—including health care—contributed to several presidential victories in the Americas this decade by left-leaning candidates who promised to improve delivery of those services.

In a number of cases, inability of central governments to provide health care and other services to their people has benefited

warlords, terrorist groups, and other nonstate actors.

- Hezbollah's provision of health and social welfare services over the past twenty years has legitimized the organization as a political force in Lebanon, while HAMAS's delivery of health and social services was a factor in its winning of legislative elections in the Palestinian territories.

In Afghanistan, despite international assistance and an increase in health clinics across the country, quality and availability of health-care remain among the poorest in the world. Shortfalls in providing health-care and other services have helped to undermine the central government's credibility while boosting that of a resurgent and increasingly sophisticated Taliban according to Eurasia Group.

## Military Readiness

The chief potential impact of health on *military readiness* appears to be its effect on the younger generation. In particular, high child mortality and/or widespread ill health among young people reduce the downstream availability of healthy and capable military recruits in a society, a situation faced in particular by North Korea and Russia.

- Health issues are straining Russia's military, which operates overwhelmingly as a conscript service; currently, one-third of would-be conscripts cannot perform military service due to physical or psychological infirmity, according to Russia's Main Military Medical Directorate.
- As a consequence of early childhood malnutrition, an estimated 17 to 29 percent of potential *North Korean* military conscripts will have cognitive

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<sup>12</sup> A phenomenon of the magnitude of the fall of feudalism—occasioned by lengthy bubonic plague outbreaks in Medieval Europe—likely will not occur in the absence of plague-like outbreaks that recurred over the course of centuries and impacted every social class from peasant to royalty.



deficiencies severe enough to disqualify them for service by US standards.<sup>13</sup> The National Center for Medical Intelligence estimates that mental fitness of North Koreans subject to military conscription will be at its weakest during the period 2009-2013 as children born during the severe food shortages and famine of the 1990s reach military age.

Worldwide, the capability of a government or organization to provide adequate health protection for its military will significantly impact its ability to project force abroad. Deployed militaries will likely continue to be vulnerable to the ravages of disease, despite a global trend towards forces that are more technologically sophisticated and less dependent upon large quantities of personnel.

In the case of standing militaries in southern and central Sub-Saharan Africa, however—where high HIV/AIDS prevalence has long been thought to endanger the functioning of some of the most developed forces on the continent as well as the UN and African Union peacekeeping operations to which they contribute—the risks of disease may have been overstated:

- A 2006 study by one of the world's most renowned HIV/AIDS researchers challenges assertions that military populations have a higher prevalence of HIV/AIDS than civilian populations. Many such calculations, in fact, have had little data to back them, and accounts of the ravages of HIV/AIDS on African militaries are frequently anecdotal.<sup>14</sup>

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<sup>13</sup> This figure does not include individuals who are mentally capable but have physical conditions disqualifying them from service.

<sup>14</sup> Reasons for lack of data include reluctance of many countries to collect information on HIV prevalence in their militaries or to publicize or share what data they have. Most militaries by 2004, however, had prohibited recruitment of HIV-positive personnel. In

- Even if military populations are a high-risk population for contracting HIV, the military also provides an environment conducive to HIV/AIDS intervention. In recent years many African militaries have instituted education and awareness, condom distribution, and testing programs, often with the assistance of the US Department of Defense HIV/AIDS Prevention Program.

## **Health as Opportunity: A New Look at a Successful Paradigm**

Health aid as provided by the developed world is most often tied to infectious diseases that are seen as posing the greatest humanitarian or security threat. HIV/AIDS, for example, garners about 25 percent of global health aid while constituting 5 percent of the disease burden in low- and middle-income countries according to an early 2008 study in the *British Medical Journal*.

- The fight against infectious diseases often appeals to international donors and affected countries alike: preventable with vaccines or treatable with courses of antibiotics, and with the efficacy of such interventions readily discernable and measurable. With infectious diseases commonly having the highest death toll in children and young adults, the question of *when* to intervene is also relatively apparent.

While such an approach may at least temporarily stem the targeted disease, however, it may or may not address other health needs in poor countries that are equally, or more, urgent.

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the case of UN peacekeeping operations, the UN neither conducts its own HIV/AIDS testing nor requires troop-contributing countries to conduct such testing.

- Chronic conditions, however, can be far more complicated to deal with than infectious ones. They are more likely to require prolonged interventions—public education, lifestyle changes, complex diagnoses, and life-long medication and monitoring—and success or failure of these measures may be much more difficult to fathom.
- HIV/AIDS, although an acute infectious disease that can be treated with antiretrovirals, is similar to chronic diseases in its requirements for the prolonged and complex interventions detailed above.
- In *Afghanistan*, amelioration of major health challenges such as hepatitis B, drug addiction, high maternal and child mortality, and access to basic health-care could serve as means of bolstering support for the Karzai administration and the allied reconstruction effort, a greater degree of gender equality, and economic development.
- Visible Coalition fostering of better health-care in *Iraq* could have similar impacts, as well as enabling the Iraqis to develop the human capital needed to grow and diversify their economy.
- Marked health improvements in these two Muslim countries could play a role in easing frictions between the West and the Islamic world.

*Developed world efforts similar to that exerted by the US in the fight against HIV/AIDS—but focused on broader global health objectives—could simultaneously help advance economic development, foster diplomacy, and improve overall health worldwide.*

**Medical Diplomacy.** States such as Cuba and Venezuela garner a disproportionate amount of international influence thanks to their provision of health services worldwide. More and better-publicized developed world medical diplomacy efforts—for example, the US Naval Ship Comfort’s humanitarian tour of 12 *Latin American* countries in 2007—could mitigate such influence while improving the health of citizens of poor countries.

**Reconstruction and Stabilization.** A recent RAND nation-building study has indicated that the ability of occupying forces or nascent governments to visibly boost public health and health-care capabilities can play a major role in enhancing the credibility of nation-building efforts.

**Smoothing Relations with Adversaries.** Cooperation on health issues has historically kept international lines of communication open even at times of increased tensions among countries. Western health cooperation with *Iran* and *North Korea*—for example, assisting Pyongyang with the country’s heavy health burden or encouraging Tehran to consolidate its recent improvements in health-care—could serve as a means of “diplomacy through the back door.”

- Increased incidence of polio in Muslim countries or Iran’s rising incidence of drug addiction could be two areas for engagement with Tehran.

**Fruitful Engagement with Rising Powers.** International assistance with the significant health burdens stemming from environmental degradation could provide potential opportunities for cooperation with *China*, *India*, and *Russia*.

- In the case of China, shared interests by it and the developed world in strengthening African capacities to fight infectious diseases could be an additional means of cooperation.

***Easing North-South Tensions.*** Joint developed-developing world efforts to tackle degradation of health-care services in *poor countries*—frequently the result of South-to-North migration of health professionals in search of better pay, emphasis in some low- and middle-income countries on health tourism over provision of basic health-care, lack of affordable drugs, and the resultant proliferation of harmful counterfeit medications—could be a means of trust-building between North and South.

***Advancing Economic Development.*** Increased developed world attention to the top three killers in the developing world—maternal and newborn mortality, infections of the lower respiratory tract, and diarrheal diseases, with their disproportionate impacts on young children—as well as highly debilitating NTDs could mitigate a tremendous portion of the health burden in low-income countries while potentially helping them out of poverty.

*Significant improvements to global health are increasingly beyond the capacities of any single actor. Multilateral organizations can be effective force-multipliers, reducing financial and other costs to any one country. The global health infrastructure is under strain, however, and successful execution of programs may require a fresh look at mechanisms for delivering health aid.*

- The World Health Organization is currently constrained by the fact that the bulk of monies provided by member countries are tied to the battling of single

diseases. Freeing up funding for more comprehensive programs could render the WHO a more effective partner in fostering better global health—as could renewed commitments by states and private actors to multilateral health partnerships.

- An agreement by WHO member states in 2005 to revise and implement new International Health Regulations<sup>15</sup> (IHR) is a significant step forward for multilateral cooperation on health issues, particularly infectious diseases—even if not all member states have been fully compliant with the new regulations.

The Global Fund for HIV/AIDS, TB, and Malaria, an independent public-private partnership, has thus far been primarily focused on tackling of specific diseases, but its operating procedures offer ideas for multilateral cooperation on other health needs.

- These include fostering of multi-sector coalitions—governments, multilateral organizations, nongovernmental organizations, and private enterprise—to implement projects; heavy dependence upon local expertise for the running of programs; and placing a premium on results.

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<sup>15</sup> The IHR requires that countries have minimum disease detection and reporting requirements with the aim of increasing transparency.

## **What Works? Global Health Success Stories**

A recent Center for Global Development study<sup>16</sup> catalogued successful public health programs in the developing world.<sup>17</sup> *A recurring theme is the need for ownership of public health measures by local governments and populations.*

***Success is possible even in very poor settings with hard to reach populations.***

*Cases:* Guinea worm and river blindness control efforts in African and South Asia; vitamin A supplementation programs; improvement to health of mothers and children in Bangladesh and Mexico.

*Mechanisms:* Working through community to reach residents of remote places; sensitivity to cultural factors (e.g., women unable to venture far from home); financial incentives to take part in well-child services.

***Even governments of poor countries can take a leading role in improving the health of their populations.***

*Cases:* Halving of maternal mortality in Sri Lanka; cross-border collaboration in South America to eradicate Chagas disease; fighting measles in southern Africa.

*Mechanisms:* Collaboration of affected governments with each other, NGOs or the business community; design, delivery, and monitoring of health services by local public health systems; use of local resources as opposed to international donations.

***Behavior changes and good management are as important as technology in fostering public health.***

*Cases:* Control of guinea worm in Africa; fight against diarrheal diseases in Bangladesh; cutting tobacco use in Poland and South Africa.

*Mechanisms:* Families learning to filter their water and to fix rehydrating solutions; in the case of tobacco use, a combination of communication, legal measures, and taxation.

***International agencies can overcome institutional and bureaucratic barriers to work for a common purpose.***

*Cases:* Guinea worm eradication; control of river blindness.

*Mechanisms:* Collaboration among private foundations, donor countries, the WHO and other UN bodies, NGOs, donor countries, private companies, affected rural communities and governments.

***Cause-and-effect (health programs and outcomes) can be measured.***

*Cases:* The Progres program in Mexico, which provided education and health interventions to families.

*Mechanisms:* Special data collection efforts; use of conditional cash grants.

*(Continued on next page...)*

<sup>16</sup> *Case Studies in Global Health: Millions Saved*, 2007.

<sup>17</sup> Programs were deemed successful if they could be implemented at the national, regional, or global level; addressed a significant public health problem; had a clear and measurable impact on a population's health; had staying power; and were cost-effective.

*(Continued...)* **What Works? Global Health Success Stories**

***Disease-specific programs and comprehensive efforts to improve health systems can be integrated.***

*Cases:* Distribution of vitamin A; salt iodation; tobacco control; child immunization.

*Mechanisms:* Pairing child immunization with fundamental improvements to basic pediatric health services; boosting success of disease-specific programs through inclusion of training, logistics, surveillance, and referral systems in a country's health infrastructure.

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MAP: Typology of Countries by Health Care Status

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## Annex:

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### Select Case Studies<sup>18</sup>

#### Afghanistan

*WHO Ranking of Health System (out of 190 countries rated): 173<sup>19</sup>*

NCMI Ranking of Health Care Capabilities: 4 (Poor)

- Health infrastructure largely destroyed by decades of war and neglect.
- Many health-care personnel have fled the country; approximately 60 percent of those remaining based in cities, while need is greatest in rural areas.
- Afghanistan highly dependent upon outside donors and NGOs for medical equipment, supplies, and health-care services.

#### *Most Urgent Health Problems:*

- Hepatitis B (more than 11,000 deaths annually) linked with skyrocketing drug use (one million addicts and rising).
- 17<sup>th</sup> highest incidence of TB in the world.
- 25 percent of Afghan children die before their fifth birthdays (malnutrition, respiratory infections, diarrheal diseases caused by inadequate sanitation and unsafe drinking water).
- Second highest maternal mortality rate in the world (1,600 deaths per 100,000 live births).

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<sup>18</sup> These twelve case studies were chosen for their exceptionally rich combination of strategic and health factors: **Afghanistan** and **Iraq** are significant reconstruction and stabilization efforts. **China** and **India** are potential superpowers, while Russia aspires to regain superpower status. Those three countries plus **Brazil** comprise the “BRICs,” recognized by Goldman Sachs in 2005 as the largest and most important emerging economies. **Cuba**, **Iran**, and **North Korea** are “rogue” states. **Nigeria** and **South Africa** are regional powers in the AFRICOM area-of-responsibility. **Mexico** is on the US border, and is a key trading partner and a linchpin in the war on drugs. **Iran**, **Iraq**, **Mexico**, **Nigeria**, and **Russia** are major oil producers. **China**, **India**, **North Korea**, and **Russia** possess nuclear weapons, while **Iran** is an aspiring nuclear power. **China**, **India**, **Nigeria**, **Russia**, and **South Africa** have highly-publicized HIV/AIDS burdens. The **Cuban**, **Iranian** and **Mexican** health systems are the only three that make the top 100 as ranked by the WHO.

<sup>19</sup> Both WHO and NCMI rankings are included in each case study. Both entities use many of the same health indicators (e.g., infant mortality rates and number of doctors per 1000 inhabitants), but the WHO also looks at equitability of access to health-care within a country. NCMI rates South Africa “good,” for example, because the country’s health-care capabilities are the highest quality in Sub-Saharan Africa. WHO only rates South Africa 175 out of 190, on the other hand, because significant black/white and rural/urban health-care discrepancies remain.

*Other:*

- Endemic polio; malaria; diseases carried by ticks and sand flies.
- HIV/AIDS prevalence estimated at 0.01 percent.

*Strategic Considerations:*

- Inability to develop human capital (children at high risk of impaired physical and cognitive development due to traumatic births, malnutrition, and disease).
- Poor reproductive health major impediment to Afghan women's and girls' ability to get an education or participate in paid labor.
- Widening health-care disparities between urban and rural areas, as well as among provinces, have exacerbated intra-provincial and ethnic tensions, increased disillusionment with the central government, and spurred Afghans to seek help from local warlords.
- Rising drug addiction putting further significant financial burdens on the addicted and their families.

*Potential Opportunities:*

- Amelioration of such major health challenges such as Hepatitis B, drug addiction, high maternal and child mortality, and access to basic health-care could bolster support for the Karzai administration and the allied reconstruction effort.
- Better health for women and girls specifically could advance both gender equality and economic development.

## **Brazil**

*WHO Ranking of Health System (out of 190 countries rated): 125*

*NCMI Ranking of Health Care Capabilities: 4 (Poor)*

- A plan instituted in 1996 to revitalize Brazil's health care system remains to be implemented in poor, marginalized, and violent areas. Critical challenges remain, including persistent inequities and inefficiencies in the financing of health services.
- 95 percent of population has access to health-care services, but public facilities are poorly equipped, overcrowded, and understaffed, and waiting time for care is lengthy.

*Most Urgent Health Problems:*

- The Brazilian minister of health in 2008 reported 600,000 cases of malaria in Amazonas State, which also suffers from a high rate of hepatitis B (27 percent of the population).
- Dengue outbreaks have become an increasing urban threat all over Latin America, but particularly in Brazil. Although dengue was virtually unknown in the country prior to the late 1980s, it now accounts for seven out of every ten new cases in the region, with Rio de Janeiro municipality in particular recording ever-increasing outbreaks, according to the US Centers for Disease Control and Prevention.

- HIV/AIDS prevalence is relatively low (estimated at 0.7 percent), but is transforming from a primarily middle class phenomenon to become increasingly common among the very poor. Brazil has been successful enough in combating HIV/AIDS, however, that its strategy became the foundation for WHO HIV/AIDS policy.
- Transmission of TB is a continuing issue in heavily-populated southeastern Brazil.
- Infant mortality rates are 32 per 1000 births, or 4-5 times that of the US.

*Strategic Considerations:*

- Fiscal pressures to provide low cost medications have led the government to threaten to circumvent intellectual property rights on pharmaceuticals.

*Potential Opportunities:*

- Possible areas for international engagement with Brazil include malaria in Amazonas; Brazil's plan to provide health-care assistance and training to fellow MERCOSUR members and Portuguese-speaking countries in Africa; and ongoing Brazilian efforts to organize a national health-care system.

## **China**

*WHO Ranking of Health System (out of 190 countries rated):* 144

*NCMI Ranking of Health Care Capabilities:* 4 (Poor)

- Government has increased health spending rapidly in recent years, but per capita expenditures (roughly \$100 in 2007) remain low.
- In spite of a new government program to achieve universal rural coverage in recent years, large health-care gaps between urban and rural areas remain (80 percent of rural population uninsured, helping to spread hepatitis and TB).

*Most Urgent Health Problems:*

- Chronic diseases cause 80 percent of Chinese deaths; smoking and untreated hypertension are key factors.
- TB, Hepatitis B, dysentery, gonorrhea, syphilis (most common infectious diseases).
- Severe environmental degradation (air pollution levels blamed for 400,000 premature deaths annually; 180 million Chinese drink contaminated water daily with resultant disease outbreaks, birth defects, cancer, and kidney and bone disorders). Sixteen out of twenty of the world's cities with the worst air quality are Chinese, and over 400,000 premature deaths per year are blamed on air pollution levels.
- Southern China could be the launching point for the next influenza pandemic (as it was in 1957 and 1968, as well as for the SARS outbreak of 2003), given its population density and close interaction between humans and livestock.

*Other:*

- TB.
- HIV/AIDS prevalence estimated at 0.4 to 0.7 percent.

*Strategic Considerations:*

- Poor health threatens to slow economic growth by incapacitating workers and incurring heavy health-care costs.
- Protestors against the health effects of industrial pollution in China are growing increasingly bolder. Sensitivity of this issue underscored by Chinese blocking of domestic publication of World Bank study on pollution-linked illnesses and deaths in China, according to Eurasia Group.
- Potential political issues resulting from growing public attention to poor health and nutritional product standards pose challenges to Communist Party rule.

*Potential Opportunities:*

- International assistance with the significant health burdens stemming from environmental degradation could provide potential opportunities for engagement with Beijing.
- Shared interests by China and the developed world in strengthening African capacities to fight infectious diseases could be an additional means of cooperation.

## **Cuba**

*WHO Ranking of Health System (out of 190 countries rated): 39*

NCMI Ranking of Health Care Capabilities: 2 (Good)

- Medical personnel widely considered the best among those of developing countries. Even with a high number of medical personnel deployed with Cuban overseas medical missions (30,000-40,000 personnel in 69 countries), availability of medical services is still widespread.
- Cuban government complains about lack of supplies, equipment, and even the most common drugs such as aspirin as a result of the US embargo, but can buy a full range of medical products from non-US suppliers.
- Nonetheless manages to produce developed-world-quality health indicators (infant mortality, life expectancy) thanks to free, universal care that puts an emphasis on routine primary care. Vaccination of all age groups is around 95 percent.

*Most Urgent Health Problems:*

- Heart disease, strokes, and cancers the most common cause of death in adults.

*Other:*

- The Cuban government estimates HIV/AIDS prevalence at less than 0.1 percent.

*Strategic Considerations:*

- Sale of medical services may be one of Havana's top sources of income, netting the country \$3 billion in 2006 (slightly more than what it earned from tourism during the same period), according to private sector analysts.
- Cuba uses medical diplomacy to bolster its standing in international forums, particularly the UN.

*Potential Opportunities:*

- A generally healthy population bodes well for future Cuban economic development.

## **India**

*WHO Ranking of Health System (out of 190 countries rated):* 112

*NCMI Ranking of Health Care Capabilities:* 4 (Poor)

- One of the lowest rates of health-care expenditure in the world.
- Public health-care overburdened in cities and virtually non-existent in rural areas.
- Private system fills many gaps, but is unregulated (malpractice is rampant) and ruinously expensive for most Indians.
- In addition to public/private and urban/rural health-care discrepancies there are also regional ones (western and southern coastal states better-served than northern and central ones).

*Most Urgent Health Problems:*

- Infectious diseases (TB, many vaccine-preventable illnesses) account for about half of Indian deaths, 60 percent of which are those of children.
- Cardiovascular diseases account for about 20 percent of Indian deaths, related to high rate of hypertension; most precipitous climb of type 2 diabetes in the world; some of the world's highest incidences of tobacco-related cancers.
- Malnutrition a problem across all socio-economic classes and anemia afflicts two-thirds of Indian children.
- More than 700 million Indians lack adequate sanitation.

*Other:*

- HIV/AIDS prevalence estimated at 0.3 percent.

*Strategic Considerations:*

- Inability to develop human capital: children at high risk of impaired physical and cognitive development due to traumatic births, malnutrition, and disease, while poor reproductive health is a major impediment to Indian women's and girls' ability to get an education or participate in paid labor.

- Growing health and health-care disparities within India could contribute to support for popular political movements (e.g., the Naxalite and Marxist parties) that champion the causes of the economically and politically excluded. These parties are strongly opposed to closer US-India links.
- Health challenges such as asthma and other respiratory conditions could increase domestic pressure on the Indian government to adopt limited environmental reforms. In the absence of such reforms, India could see more strikes against polluters (e.g., those seen in Dhenkal against steel factories that contributed to water pollution).

*Potential Opportunities:*

- As the political salience of domestic environmental issues hits home, India may be increasingly open to cooperation on pollution control and the significant health burdens stemming from environmental degradation.

## **Iran**

*WHO Ranking of Health System (out of 190 countries rated): 93*

NCMI Ranking of Health Care Capabilities: 3 (Fair)

- Health-care expenditure is large for region (11 percent of government spending).
- Although best medical care in cities, particularly Tehran, urban/rural health-care gaps (particularly in areas of child and maternal mortality) reduced over past 30 years by the Primary Health Care System that provides basic care in every village.
- Over past three decades Iran has developed pharmaceutical production sufficiently to greatly reduce its dependence upon imported medicines.

*Most Urgent Health Problems:*

- Cardiovascular disease (42 percent of Iranian deaths).
- Highest per capita rate of intravenous opiate use (3 percent of population) in the world.
- Rising overweight and obesity (54 percent of men and 70 percent of women).

*Other:*

- HIV/AIDS prevalence estimated at 0.02 percent, mostly relating to drug use.
- Thanks to health care expenditure that is large for the region, Iranians have actually seen marked improvements in recent decades in access to, and quality of, health care; sharp falls in malaria, TB, and measles; and a precipitous drop in maternal mortality.

*Strategic Impacts:*

- Steady improvements in reproductive health and clerical approval of birth control are key contributors to increased female participation in higher education and the paid workforce in Iran—developments that are usually predictors of GDP growth in a country. Healthier children as a result of childhood vaccination programs could also reap economic benefits for Iran.

*Potential Opportunities:*

- Increased incidence of polio in Muslim countries or Iran's rising incidence of drug addiction could be two areas for international engagement with Tehran. Poor relations between Iran and the West, however, will likely continue to hinder cooperative action on health and development issues.

## **Iraq**

*WHO Ranking of Health System (out of 190 countries rated):* 103

NCMI Ranking of Health Care Capabilities: 4 (Poor)

- Iraqi health sector suffered years of neglect under Saddam Hussein, and was severely impaired by widespread looting and vandalism following Operation Iraqi Freedom.
- Death, internal displacement, and emigration of medical personnel over the past five years have also impaired medical readiness.
- Iraq will remain dependent on foreign medical donations for the foreseeable future.

*Most Urgent Health Problems:*

- Continued high incidence of diarrheal disease due to lack of access to potable water and poor sanitary conditions.
- More than a doubling of maternal mortality between the late 1980s and 2006.

- Highest newborn death rate of any middle-income country, and high rates of child mortality from diarrheal diseases, lower respiratory infections, and malaria.

*Other:*

- HIV/AIDS prevalence estimated at 0.1 percent.

*Potential Strategic Impacts:*

- Lingering health issues in Iraq could significantly slow the country's development of intellectual capital and slow economic diversification beyond the oil sector.
- Rising incidence of pregnancy-related complications and maternal mortality could be a contributor to growing gender inequality in Iraq.
- Degradation of health services undermines the credibility of the Iraqi government and coalition forces.

*Potential Opportunities*

- Visible Coalition fostering of better health-care could bolster support for the Iraqi government and for reconstruction efforts.
- Improved health for women and girls specifically could advance both gender equality and economic development.

## **Mexico**

*WHO Ranking of Health System (out of 190 countries rated): 61*

NCMI Ranking of Health Care Capabilities: 3 (Fair)

- Health-care infrastructure steadily improving thanks to enactment of reforms in 2003, including Seguro Popular (universal insurance) plan.
- Projected health expenditure by Mexican government for 2008 will be 17 percent higher than that for 2007.
- Major urban areas have high-end health-care facilities comparable to those found in US and every mid- to large-sized city has at least one first-rate hospital.
- Urban/rural health-care discrepancies remain, although services in rural Mexico are steadily improving.

*Most Urgent Health Problems:*

- Cardiovascular disease accounts for the largest percentage of Mexican deaths (16.4 percent), followed by diabetes (13.1 percent), and cancer (12.9 percent), all related to rising incidence of obesity and some of the worst air pollution in the world.
- Methamphetamine, cocaine, and heroin abuse on the rise.



*Other:*

- Adult HIV/AIDS prevalence estimated at 0.3 percent.

*Strategic Considerations:*

- Improvements in Mexican health since the 1970s to the present correlate with economic growth during the same period, and continued growth in the Mexican economy could lessen pressures to emigrate northwards.
- A growing burden of diabetes and other obesity-related chronic illnesses, however, could affect government finances—a challenge likely to be exacerbated in coming years by declining oil production in Mexico, which may lead to more limited resources.
- Indigenous populations living in remote areas have less access to health-care than other segments of Mexican society, and this could be a factor in their continued impoverishment relative to the rest of the population.
- Credibility of the Calderon government is contingent primarily upon its ability to tackle drug-related violence and restore law and order. Improving health indicators, however, could play a secondary role in enhancing public support for the current regime.

*Potential Opportunities:*

- More international recognition of Mexican progress in the health arena, augmented by health assistance, could counteract tensions over immigration- and drug-related issues.

## **Nigeria**

*WHO Ranking of Health System (out of 190 countries rated):* 187

*NCMI Ranking of Health Care Capabilities:* 5 (Unsuitable)

- Health-care system has deteriorated over past two decades, with political instability, corruption, and mismanagement preventing government health-care allocations from getting to their destinations.
- Large parts of the country lack even basic health-care provision.
- An unmonitored blood supply is culpable in spread of HIV/AIDS (estimated 10 percent of Nigerian cases caused by blood transfusions).

*Most Urgent Health Problems:*

- Adult HIV/AIDS prevalence estimated at 5.4 percent (lower than in other African countries, but in absolute numbers has the most HIV/AIDS cases in the world after South Africa); women especially vulnerable, accounting for jumps in the number of HIV-positive children in recent years.
- 70 percent of world polio cases.
- High child mortality due to lack of immunization and water-borne infections.

### *Strategic Considerations:*

- Oil production that makes Nigeria an economic powerhouse in western Africa unlikely to be impacted by health problems, but poor health could hinder any efforts to diversify Nigeria's economy into other, more labor-intensive or skill-intensive sectors.
- Prior to attaining office, president Umaru Yar'Adua used strong rhetoric regarding need to address Nigeria's health-care problems; inability to follow through could help undermine credibility of his administration.
- Health-care shortfalls are most pronounced in the North, and inequitable distribution of health services could further exacerbate regional, ethnic, and religious tensions.
- Nigeria is a long-standing troop- and police-contributor to regional and UN peacekeeping operations. Rising HIV rates in Nigerian peacekeepers could *in the very long run* have a negative impact on Nigeria's ability to maintain a healthy and capable peacekeeping force—and by extension its projection of regional influence. HIV prevalence in the military would have to be considerably higher, however, for it to significantly constrain peacekeeping capabilities.

### *Potential Opportunities:*

- Better health for women and children (clean water; immunizations; maternal health) could aid development.
- Improved health-care for both North and South could shore up regime credibility and country stability.
- International addressing of the Niger Delta's large gas-flaring problem could ameliorate the respiratory ailments in that region.

## **North Korea**

*WHO Ranking of Health System (out of 190 countries rated): 167*

*NCMI Ranking of Health Care Capabilities: 5 (Unsuitable)*

- Economic crisis and famine of 1990s fueled breakdown of once-efficient health-care system.
- Lack of medicine, equipment, sanitation, and reliable energy supplies make quality health-care virtually unobtainable outside of Pyongyang.
- Persistent refusal of international health expertise and assistance makes significant short-term improvements unlikely.

### *Most Urgent Health Problems:*

- TB, scarlet fever, and measles particularly prevalent, although Pyongyang's secretiveness makes outbreaks extremely difficult to verify and track.
- Chronic diseases account for an estimated 40 percent of deaths.
- Even after the widespread famine of the 1990s, prolonged and severe malnutrition persisted; more than half of North Korean children are stunted or underweight, while two-thirds of young adults are malnourished or anemic. The World Food Program currently warns that a

new food crisis is in the making as the result of floods and North Korea's refusal to accept food aid from a new South Korean government that is highly critical of Pyongyang.

*Other:*

- North Korean-manufactured illicit drugs—an effort to earn hard currency—increasingly used by citizens of that country as substitutes for scarce medicines or to relieve hunger or boredom.
- HIV/AIDS prevalence is negligible.

*Strategic Considerations:*

- Widespread malnutrition and accompanying physical and cognitive disabilities among DPRK children and young people likely inhibitors of economic growth—with or without opening to the outside world or reunification with the South.
- If reunification occurs, South Korea will face costs not only of incorporating an economic void, but also those of a huge health-care burden. Seoul could look to other countries or to multilateral organizations to help defray expenses.
- Poor health is weakening military readiness because capable new recruits are in short supply. Loyalty may also erode over time, according to Eurasia Group; even when soldiers are well fed, they may be concerned about their malnourished family members.
- The famine of the 1990s destroyed absolute state control of food rationing, internal movement of citizens, and information as North Koreans were compelled to defy state restrictions in their struggle for survival—and as those who had escaped to China in search of food and work returned with news of the outside world, according to Human Rights Watch.

*Potential Opportunities:*

- Health cooperation (amelioration of North Korea's heavy health burden) could serve as a means of “diplomacy through the back door.”

## **Russia**

*WHO Ranking of Health System (out of 190 countries rated):* 130

*NCMI Ranking of Health Care Capabilities:* 3 (Fair)

- Following the breakup of the Soviet Union the health-care system lost much of its government subsidies, resulting in shortages of equipment, medicine, and care facilities.
- In spite of efforts at reform since the 1990s, quality and availability of services are uneven. As in many countries, the best care is available in large cities while lacking in rural areas.

*Most Urgent Health Problems:*

- Cardiovascular disease responsible for 58 percent of Russian deaths (3-4 times higher than in other developed countries).

- High rate of alcohol consumption, making it a world leader in violent deaths and accidental poisonings.
- Only European country in the WHO's top ten countries for TB prevalence; global first place for highest rates of circulating MDR TB strains.
- Involuntary infertility rate highest of any industrialized country.
- Adult prevalence of HIV/AIDS relatively low at 1.1 percent, but infection rate is one of the fastest growing in the world.

*Other:*

- Widespread air, water, and soil contamination.

*Strategic Considerations:*

- Production of Russia's most valuable resource—oil—unlikely to be impacted by health problems, but poor health could hinder continued economic growth by limiting possibilities for diversifying the Russian economy away from oil.
- Health issues are straining Russia's military, which operates overwhelmingly as a conscript service; currently, one-third of would-be conscripts cannot perform military service due to physical or psychological infirmity, according to Russia's Main Military Medical Directorate.

*Potential Opportunities:*

- Russia already receives international assistance for its health-care initiatives, particularly for fighting HIV/AIDS. Extension of assistance to other compelling Russian health issues—e.g., the health burden stemming from environmental degradation—could be another venue for international engagement with Moscow.

## **South Africa**

*WHO Ranking of Health System (out of 190 countries rated): 175*

NCMI Ranking of Health Care Capabilities: 2 (Good)

- South Africa has one of the most highly developed health-care systems on the African continent.
- In spite of post-Apartheid health-care reform, however, significant black/white and rural/urban discrepancies remain. The top 20 percent of the population (primarily whites) enjoy private health-care, while the remainder (primarily blacks) rely on an as-yet under-funded public health system.

*Most Urgent Health Problems:*

- HIV/AIDS leading killer, responsible for roughly one-third of all fatalities; adult prevalence is 25 percent, and is closely connected to fourth highest prevalence of TB in the world.

- Intensive focus on HIV/AIDS in South Africa, however, obscures high burden of chronic disease (28 percent of deaths) also found there; death rates for persons under 40 rising rapidly.
- Homicide, suicide, and accidents main causes of death for South African men aged 15-24.

*Other:*

- Other virulent infections include malaria, Hepatitis B, and waterborne illnesses.
- Overweight and obesity ubiquitous (29 percent of men and 56 percent of women overweight and 9 percent of men and 29 percent of women obese); association of weight loss with HIV/AIDS partly to blame.

*Strategic Considerations:*

- Even post-Apartheid, South Africa has one of the most unequal patterns of income distribution in the world (poorest 40 percent of households garner only 4 percent of annual income), and lingering discrepancies in access to health care could perpetuate this gap.
- HIV/AIDS is prevalent in all strata of society. A rise in infection rates among skilled workers could worsen skills shortages and raise the cost of HIV/AIDS treatment for employers.
- South Africa's denial of its HIV/AIDS crisis over the past several years appears to have had a role in discrediting the Mbeki administration.

*Potential Opportunities*

- Over-emphasis by the international community on South Africa's HIV/AIDS crisis could be perceived by that country as criticism, but support for other health-care concerns might be less controversial—while helping to rectify under-recognized health issues such as chronic disease.

### **The “Top 50” Health Systems Worldwide (WHO Rankings)**

With a handful of exceptions, this list is dominated by very small states, island states, oil-rich states, and/or those with sharply declining birthrates:

- |                    |                          |                    |
|--------------------|--------------------------|--------------------|
| 1) France          | 21) Belgium              | 41) New Zealand    |
| 2) Italy           | 22) Colombia             | 42) Bahrain        |
| 3) San Marino      | 23) Sweden               | 43) Croatia        |
| 4) Andorra         | 24) Cyprus               | 44) Qatar          |
| 5) Malta           | 25) Germany              | 45) Kuwait         |
| 6) Singapore       | 26) Saudi Arabia         | 46) Barbados       |
| 7) Spain           | 27) United Arab Emirates | 47) Thailand       |
| 8) Oman            | 28) Israel               | 48) Czech Republic |
| 9) Austria         | 29) Morocco              | 49) Malaysia       |
| 10) Japan          | 30) Canada               | 50) Poland         |
| 11) Norway         | 31) Finland              |                    |
| 12) Portugal       | 32) Australia            |                    |
| 13) Monaco         | 33) Chile                |                    |
| 14) Greece         | 34) Denmark              |                    |
| 15) Iceland        | 35) Dominica             |                    |
| 16) Luxembourg     | 36) Costa Rica           |                    |
| 17) Netherlands    | 37) United States        |                    |
| 18) United Kingdom | 38) Slovenia             |                    |
| 19) Ireland        | 39) Cuba                 |                    |
| 20) Switzerland    | 40) Brunei               |                    |

## **Linkages Among Health Factors**

### **Acute Infectious Diseases Intersect With:**

- *Chronic Diseases.* A number of chronic conditions, including certain cancers, are caused by infections; persons with chronic conditions more vulnerable to infections; persons who are HIV-positive over long periods can develop cancers resistant to therapies used to treat non-HIV sufferers, according to the New England Journal of Medicine
- *Neglected Tropical Diseases.* Persons with NTDs more vulnerable to HIV/AIDS, malaria, and other infections.
- *Poor Maternal Health/Newborn Mortality.* A variety of infections can cause both pregnancy complications and birth defects.
- *Malnutrition/Anemia.* Lowers immunity to infection and inhibits the body's ability to respond to treatment.
- *Risky Behaviors/Lifestyle Factors.* Unsafe sex and drug use culpable in spread of HIV/AIDS and Hepatitis B.
- *Poor Sanitation/Environmental Degradation.* Tied to malaria, lower respiratory infections, diarrheal diseases.

### **Chronic Diseases Intersect With:**

- *Acute Infectious Diseases.* A number of chronic conditions, including certain cancers, are caused by infections; persons with chronic conditions more vulnerable to infections.
- *Neglected Tropical Diseases.* Chagas disease associated with heart failure; schistosomiasis associated with a rare form of bladder cancer.
- *Poor Maternal Health/Newborn Mortality.* A number of chronic conditions, including obesity and diabetes, can complicate pregnancy.
- *Malnutrition/Anemia.* Poor diet linked with obesity; anemia frequently suffered by persons with cancer, liver failure, or diabetes.
- *Risky Behaviors/Lifestyle Factors.* Tobacco use, poor diet, lack of exercise, drug abuse, and alcoholism heighten susceptibility to chronic disease and early death.
- *Poor Sanitation/Environmental Degradation.* The latter tied to asthma, cancer, and cardiovascular disease.

*(Continued on next page...)*

(Continued...) **Linkages Among Health Factors**

**Neglected Tropical Diseases Intersect With:**

- *Acute Infectious Disease.* Persons with NTDs more vulnerable to HIV/AIDS, malaria, and other infections.
- *Chronic Diseases.* Chagas disease associated with heart failure; schistosomiasis associated with a rare form of bladder cancer.
- *Poor Maternal Health/Newborn Mortality.* Hookworm-caused anemia linked with premature births, low birth weights, and increased maternal mortality; toxoplasmosis during pregnancy the cause of prenatal damage (blindness, hearing loss, seizures, and cognitive disorders).
- *Malnutrition/Anemia.* Helminth infections rob sufferers of essential nutrients, resulting in anemia.
- *Poor Sanitation/Environmental Degradation.* Trachoma closely linked with filth and flies.

**Poor Maternal Health/Newborn Mortality Intersects With:**

- *Acute Infectious Diseases.* A variety of infections can cause both pregnancy complications and birth defects.
- *Chronic Diseases.* A number of chronic conditions, including obesity and diabetes, can complicate pregnancy.
- *Neglected Tropical Diseases.* Hookworm-caused anemia linked with premature births, low birth weights, and increased maternal mortality; toxoplasmosis during pregnancy the cause of prenatal damage (blindness, hearing loss, seizures, and cognitive disorders).
- *Malnutrition/Anemia.* Complicates pregnancy; children malnourished either in utero or after birth predisposed to chronic physical and cognitive disorders and premature death.
- *Risky Behaviors/Lifestyle Factors.* Smoking, alcoholism, and drug abuse linked with birth defects or chronic poor health in the young.
- *Poor Sanitation/Environmental Degradation.* Can cause birth defects, and is also tied to the three biggest infectious childhood killers (malaria, lower respiratory infections, and diarrheal diseases).



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## The National Intelligence Council

**The National Intelligence Council (NIC) manages the Intelligence Community's estimative process, incorporating the best available expertise inside and outside the government. It reports to the Director of National Intelligence in his capacity as head of the US Intelligence Community and speaks authoritatively on substantive issues for the Community as a whole.**

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**Information available as of October 2008 was used in  
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**The following intelligence organizations participated  
in the preparation of this Assessment:**

The Central Intelligence Agency

The Defense Intelligence Agency

The National Security Agency

The Bureau of Intelligence and Research,  
Department of State

The National Counterproliferation Center

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